

**Marked-Up Copy**  
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**IN THE CLAIMS**

Please amend Claim 15 as follows:

--15. (Thrice Amended) A method for producing a refined microstructure of a metallic material and shifting a refined material to a periphery of a closed container to yield the refined material concentrated in an end portion of the metallic material, comprising:

subjecting the molten metallic material to a solidification process at temperatures lower than a liquidus of the molten metallic material;

applying an electric current and a magnetic field simultaneously to the metallic material during a solidification process at temperatures lower than the liquidus of the molten metallic material to crush into small pieces solid crystals of the metallic material generated during the solidification process and to shift the small pieces to a periphery of the metallic material in the closed container; and

yielding a refined microstructure of the metallic material concentrated in the end portion of the metallic material in the closed container.--